



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

COMMUNICATION
BETWEEN THE
ATLANTIC & PACIFIC OCEANS.

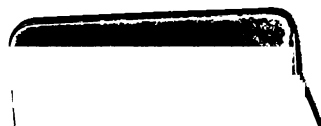
49.341

51



49.341.

384- 1. 20



49.341.

384. 1. 20

57

49.341.

384. 1. 20

57

49.341.

384. 1. 20

—

57



49.341.

384. 1. 20





PANAMÁ, NICARAGUA,

AND

TEHUANTEPEC;

OR,

CONSIDERATIONS UPON THE QUESTION OF

COMMUNICATION

BETWEEN THE

ATLANTIC AND PACIFIC OCEANS.

BY

W. B. LIOT,

CAPTAIN H. C. M.'S NAVY.



LONDON:

SIMPKIN AND MARSHALL, STATIONERS' COURT.

1849.

WALTON AND MITCHELL, PRINTERS,
24, Wardour Street, Oxford Street, London.

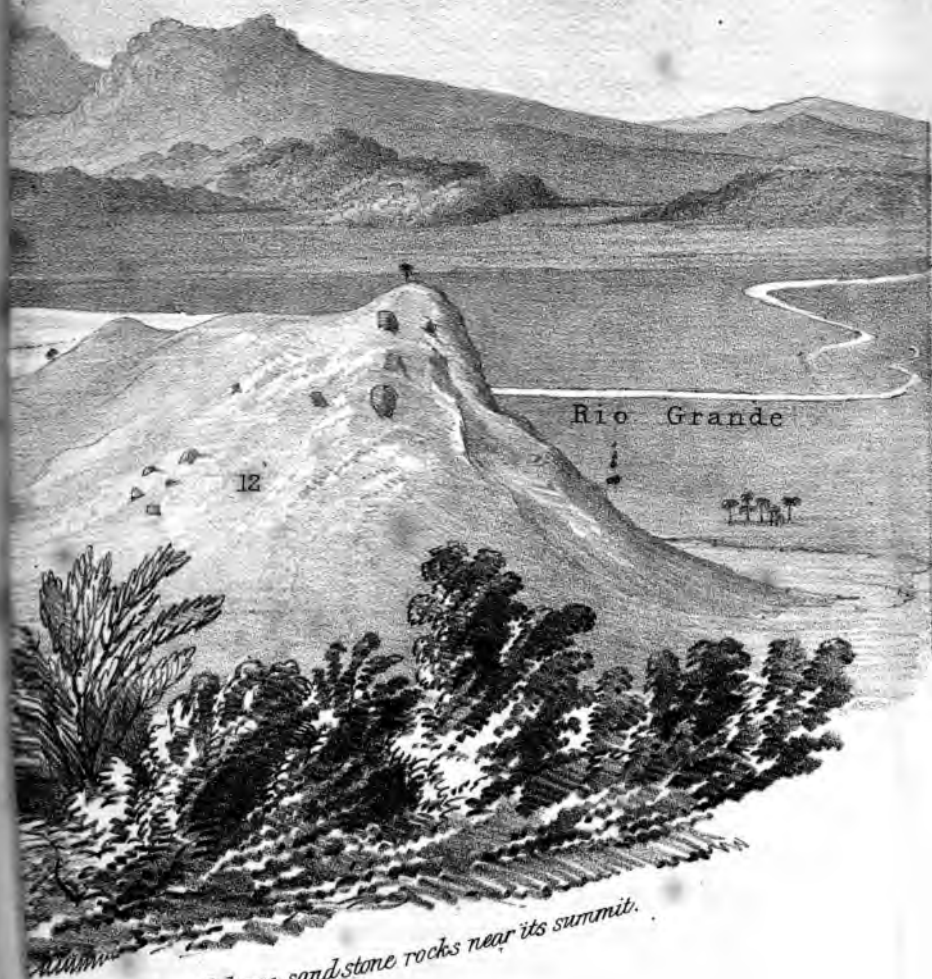


Proximity of the Fortification
to the Pier (nearly a mile)
This View supposes High Water

WALTON AND MITCHELL, PRINTERS,
24, Wardour Street, Oxford Street, London.



...nity of the Fortification
...rf or Pier (nearly a mile
...us View supposes High Wa



Grassy Hill with large sandstone rocks near its summit.

REFERENCE TO PLATE No. I.

1. Anchorage for small vessels.
2. Anchorage for large vessels.
3. The small island or rock called Farallon San José.
4. Flamingo Island.
5. Perico Island.
6. ~~Perico~~ Island.
7. Taboguilla Island.
8. Urava Island.
9. Taboga Island, where there is secure anchorage for the largest ships.
10. 10. 10. Mouth of the Rio Grande.
11. At low water the Rio Grande runs in two branches, represented by the dotted lines.



PREFACE.

THE MS. in which the following observations were originally embodied was prepared for the press several years ago; circumstances occurred, however, to delay its publication until the present moment.

I visited the Isthmus of Panamá for the first time in January and February, 1845, and upon my return to England in September of the same year, I was deputed by several gentlemen of high commercial status in the City of London, to ascertain whether the British Government of that day were willing to afford such guarantees and immunities as might secure a transit company against undue risk, should the incorporation of such a body be decided upon to establish a Macadamized carriage road or a railroad from Portobélo to Panamá: the Government, however, discouraged the overtures which were made to them, and suffered the contingent project to be abandoned. The MS. alluded to was therefore laid aside, to be reproduced (as it happens)

when the question of communication between the Atlantic and Pacific Oceans has been again brought before the public, by a rapid succession of stirring events in Mexico and California, and when it would seem to be hastening onward to a solution through the impulsive agency of American enterprise and perseverance.

I have crossed the Isthmus of Panamá six times, and in both the "wet" and the "dry seasons,"—when the River Chagres was greatly swollen, and when it was comparatively empty; and although I have been anxious upon each successive trip to verify my previous impressions of the country by the tests of further observation and experience, I can truly say that I have not seen cause to alter or essentially modify the opinions I originally conceived, and which I am about to place before the reader in the following pages.

W. B. L.

PANAMA, NICARAGUA, TEHUANTEPEC,

ETC., ETC.

ERRATA.

page 19, line 14, for, "water bourne," read "water borne."

page 52, 2nd column, line 13 from bottom, for "The export duties upon specie, &c., shipped for ports in the Pacific," read "from ports in the Pacific."

Plans have been proposed and measures contemplated for achieving this important enterprise, but although partial surveys and hasty explorations have, from time to time, been made within the region indicated, no effectual steps have yet been taken to attain their object.

It has been thought that as the gigantic task of excavating a ship canal would involve an outlay which the mere return derivable therefrom could not compensate, perhaps for years, the expense of such a work cannot, in our day, be undertaken, through the ordinary inducements to commercial enterprise; and it has been argued that, although a powerful government might be willing to make the canal, if, in doing so, it could secure to itself exclusively the benefits of such a route, yet, as it cannot be doubted that an attempt to monopolize a passage which of right should constitute one of

the great highways of the world, would challenge the world's hostility, the establishment of so important a thoroughfare has been suggested as the laudable aim of a coalition of the chief maritime powers. Such a coalition was in fact proposed, and negotiations were opened to effect it, which failed, and although a "road privilege"* has been subsequently granted (under contract) to certain individuals in France and England by the Government of New Granada, there is little hope unfortunately of their realizing the scheme to which they are pledged.

That difficulties of a grave, if not of an insurmountable nature, should beset an attempt to combine the great maritime powers in the achievement specified, would seem not only probable but inevitable.

In the first place, which line of country is most calculated for a transit by canal between the Atlantic and Pacific Oceans? And by what process could it be made the property of a coalition? Would it suit the views of its present owner to dispossess herself of it, and thereby invest strangers with a perpetual right of passage through her dominions, which might be turned against herself? Could a temporary occupancy even of the territory be secured to a confederacy of governments? And, if so, upon what terms, and under what guarantee?

Supposing these contingent difficulties surmounted, there arises then a grave financial question,—How could the proportion of capital, which would be required of each of the high contracting parties, be finally and satisfactorily adjusted?

If, at the outset, one power possessed a commerce greater or more lucrative than the rest, would not that power be called upon to contribute in proportion to the outlay? And if

* This privilege has since lapsed from the non-fulfilment of the terms upon which it was granted.

the transit were likely to benefit the coalition unequally, would not disputes arise in consequence, respecting the relative amount which each state should pay?

Another difficulty would probably be engendered by the feelings of jealousy, which could hardly fail to arise out of the administration of the transit. How could it be conducted to the satisfaction of all? Would it be possible to regulate it upon principles of strict international equality, so as to prevent any single power from taking the lead in it? And were war declared between States involved in the convention, would they then respect their mutual pledges to support a measure to which an altered policy might make them hostile?

In enumerating some of the impediments calculated to embarrass a coalition of governments in the attempt to cut a ship canal between the Atlantic and Pacific Oceans, we have stated as we think the chief obstacles to such a combination; and had it been easy to overcome them, the recognized importance of the transit (by leading to a coalition) would already probably have worked out its own fulfilment.

But although it be politically inexpedient for governments to embark conjointly in such an undertaking as the construction of a ship canal to sever the vast continent of America—an enterprise calculated indeed to confer unfading lustre upon those who should accomplish it!—are there no intermediary means by which a modified yet still eminently useful scheme of transit might be encompassed? We shall proceed to investigate this question calmly and impartially, and should our views seem limited, it may be that in the issue they will not on that account prove any the less practical or sound.

CHAPTER II.

SHIP canals, tunnels, and railroads in connection with canals, have been looked to as the means of affording those facilities of transport across the Isthmus of America which the requirements of nations have been thought to demand; but as it happens in Europe or the United States of America that works such as those we instance are not constructed without great outlay, how much more costly must they prove in regions where the population is scanty,—where the mechanical arts have never been urged into activity,—where the simplest practices of engineering are but little known,—and where the absence of steady government has hitherto checked that spirit of progress which, from the dearth of wholesome enterprise, co-existent ever with a state of anarchy, must be looked for in vain!

It is not usually the cost of an undertaking that deters capitalists, if, in other respects, the conditions seem attractive: how often indeed have millions been subscribed within brief periods towards enterprises of the most varied character, when an impression has prevailed that the investment would prove remunerative! It would not happen so however were a proposal made to raise funds for cutting a ship canal across the Isthmus of America, and we shall not only give our reasons for the assertion, but shall attempt to shew that the plans of transit for which it might be possible to raise the means, are those alone which embrace the construction of a M'Adamized carriage-road, a tramroad, or a railroad from sea to sea.

Of the several methods last described that of a railroad

is certainly the best, being more comprehensive and efficient than the others. We doubt not moreover that by proper arrangement the cost of establishing it might be kept within moderate bounds, and to that end we advise adoption of the system upon which railroads are made in the United States of America; comprising as it does that which is practically useful but comparatively inexpensive.

Previous to the adoption of ship canals, or such like works, within the Isthmus of America, common cart roads must be established throughout the regions bordering on the Pacific, to increase their means of internal communication, and give an impulse to their traffic. The resources likewise of those countries must be developed and extended, their agriculture fostered and advanced, and the authority of the executive power must be consolidated and maintained against the Hydra of revolution, in furtherance of a line of policy calculated to secure the confidence of older governments and states,—which course can alone promote or render national prosperity permanent.

At the time we write, merchandize is conveyed over most parts of South America on mules, or upon men's shoulders; and until that wretched practice is abolished and a properly organized system of land conveyance established, it would be idle to expect that the commercial or other resources of that country could advance to such a pitch of prosperity as would alone render a ship canal remunerative: while we assert this, however, we do unfeignedly believe that the present trade of Europe and the United States of North America* with the Pacific would almost compensate the outlay of a moderately expensive transit, and increase more rapidly than might seem prudent at this moment to anticipate.

* When the above was written California had not been ceded to the United States, nor had that desire of emigrating to the regions of the Pacific been engendered which has since become a passion among the nations of the earth.

CHAPTER III.

WITHIN the great American Isthmus are several tracts of country, which have long been considered calculated for purposes of transit from ocean to ocean. We shall, however, mention those only which seem to offer most advantages or the greatest facilities in connexion with the object to be arrived at.

The localities to which we point are the Isthmus of Tehuantepec, in Mexico, the region bordering upon the River San Juan and Lakes of Nicaragua and Leon in Central America, the Isthmus of Panamá, and a narrow neck of land between Cape San Blas (in the Bay of Mandinga), and a certain portion of the opposite coast, where the River Chepo empties itself into the Pacific Ocean.

The two last mentioned districts belong to the Republic of New Granada.

As first in the order we have named them, we shall commence by treating of the Isthmus of Tehuantepec.

During the years 1842 and 1843, a survey of that isthmus was made under the auspices of Don José de Garay—a Mexican gentleman high in the confidence of General Santa Anna, then President of the Republic of Mexico,—to determine the practicability of a communication by water from the Gulf of Mexico to the Pacific Ocean.

In a pamphlet, published* by the projector in explanation of his survey, it is stated, that the line of transit advocated is practicable, by rendering the River Coatzacoalcos navigable from the Gulf of Mexico to the River Malatengo, then by

* Ackerman, London, 1844.

following the course of the Malatengo to its junction with the Chichihua and taking that stream until it meets the River of Tarifa, to navigate the latter to a point not distant from the town of Tarifa, where excavations are proposed to be commenced for a line of canal to be carried across the Plains of Monetza and unite with the River Chicapa, which is to be made navigable into the Laguna Superior and it in turn into the Laguna Inferior, and that (by the Boca Barra) into the Gulf of Tehuantepec in the Pacific Ocean.

According to Sör. de Garay, the length of this passage would be about 140 British statute miles. There is an objection to it, however, at starting, which is fatal,—the absence of a port at either extremity of the line! There is a bar, moreover, at the mouth of the Coatzacoalcos, which is too shallow to obviate the want of a port or a sheltered headland in its vicinity; and, to support our assertion, we shall quote the words of General Orbegoso.*

“The bar of the Coatzacoalcos is permanent and constant, forming two canals or channels; that to the left or West has on it, in the rainy season (that is, from the beginning of June to the end of February), three and a half fathoms of water, or 21 feet, these being increased to 23 feet at high tides. That on the right or to the East, has two and a half fathoms, or 15 feet, and both during the dry season lessen three or four feet, the principal channel maintaining itself at not less than 18 feet, except perhaps under extraordinary circumstances. When a vessel would effect an entrance, with a view only to greater security, the 15 feet channel should be preferred, because it has less current in it and is probably wider, and because, when the sea breeze blows hard, the currents are rapid in the greatest channel, setting from East to West, and without taking a pilot it would be difficult, if not dangerous, to be entered by vessels of great depth of water.”

Subsequently, however, we find the following observation made by Sör. de Garay himself. “The report of Sör. Orbe-

* This officer was employed on the survey. See M. de Garay's Pamphlet.

goso," says Sör. de Garay, "commences like that of Sör. Cramer, with a description of the course of the Coatzacoalcos, and he states that it has 14 feet water upon its bar; but it is to be observed that possibly he did not enter by the deepest channel, and it was in the month of May, and during an extraordinarily dry season."

The soundings given in the preceding remarks, (even those most favourable to the Tehuantepec project,) are evidently insufficient for large vessels with full cargoes; for although the principal channel of the bar were always to maintain a depth of 18 feet, (as Sör. Orbegoso asserts it does, but afterwards admits, that "*under extraordinary circumstances perhaps it does not,*") how is a ship of 600 tons burthen, for instance, (drawing 18 feet water at least) to pass it? If there were much swell on the bar, it would be perilous for vessels of even 15 feet draft* to attempt it. Thus, then, this projected ship canal would avail only for vessels of and under 300 tons burthen, and in the season of "Norths"† great risk would attend their approach to that part of the coast, where there is neither port or shelter nearer than Vera Cruz, (120 miles upon a North-West bearing from the bar of the Coatzacoalcos); and during "Norths" the land thereabouts is not only a "dead lee shore," but it forms a perfect "*cul de sac,*" out of which sailing vessels could not escape under canvass, except by risking the passage of the bar (which *shifts*), and that they would scarcely dare without a pilot; during a hard North, moreover, the surf on the coast is so heavy, that pilots are unable to 'board' vessels, whatever their distress or danger may be.

* The writer was told at Tampico, in May last, (1845,) that Sör. Vichelli surveyed the River Coatzacoalcos a few years ago, and reported that not more than 14 feet water could always be found upon the bar.

† "Norths" are strong winds which prevail (more or less) in the Gulf of Mexico from the month of October to the end of April: they blow with great violence and raise a heavy sea.

As regards that end of the Tehuantepec Canal which it is proposed to open into the Pacific Ocean, the description of the portion of ocean (the "Gulf of Tehuantepec") with which it would communicate shews that it is a mere roadstead and not a port.

M. Chevalier observes (treating of the Tehuantepec project):* that "it would be requisite to remedy, if possible, the want of a moderately convenient port on the Pacific. Tehuantepec scarcely deserves the name of roadstead; the sea recedes day by day from its shores, the anchorage yearly becomes worse, the sand deposited by the Chimalapa increases the height and extent of the bars of sand at the entrance of the first lake, in the second, and thence into the sea, and already is Tehuantepec accessible to small vessels only."†

Could the inconvenience be obviated even which results from the want of good ports, there are other objections (scarcely less grave) to the formation of a ship canal across the Isthmus of Tehuantepec. One is its unfavourable position as regards the general commerce of the world, except that of Mexico, and the southern portion of the United States of America, (for it is by no means certain that the northern states of the Union would not find the route by Panamá quite as advantageous to them as that of Tehuantepec;) another is the expense that would attend it; a third is the uncertainty of there being a sufficient supply of water upon the summit level; and lastly, the apparent inadequacy of the shipping trade of the Indian and Pacific Oceans to yield a revenue to maintain the extensive and costly line of works required—

* See his work entitled "*l'Isthme de Panamá*. Chez Gosselin, 30, Rue Jacob, Paris."

† "On aurait ensuite à remédier s'il étoit possible à l'absence d'un port passable sur l'Océan Pacifique; Tehuantepec mérite à peine le nom de rade; la mer se retire journellement de ces côtes; l'ancorage y devient d'anné en anné plus mauvais; le sable que charrie le Chimalapa augmente la hauteur et l'entendue des barres sablonneuses placées au débouché de la première lagune, dans la seconde, et de celle-ci dans la mer, et déjà Tehuantepec n'est plus accessible qu'à des goélettes."

to clear bars and rivers of deposit and prevent them from shoaling or shifting, and narrowing their channels—to defray the expense of steam tugs to tow vessels against the current and over the bars, and to pay the salaries of superintendents, engineers, labourers, and others of the train of *attachés* requisite in an undertaking of this description.

S^r. de Garay's pamphlet informs us that the artificial portion of the Tehuantepec Canal would be 80 kilometres (50 British statute miles) long, and require about 150 locks; the expense of constructing it is computed not to exceed *pro ratâ* that of the Caledonian Canal, while the entire outlay is estimated at about £3,500,000 sterling. We are satisfied, however, from calculations of our own, that nearly double that sum would be required—for by whatsoever process S^r. de Garay may have arrived at his conclusion, it is evident that several weighty items have been overlooked; the formation of reservoirs upon high levels for instance, and the costly operation of leading mountain streams over long distances to feed them; the construction of habitations for the *employés* of the line, and the establishment of steamers to tow vessels *in transitu* from one ocean to the other. We object too that the expense of canalization in Mexico would not be greater than in Scotland, and are of opinion that the formation of a ship canal across the Isthmus of Tehuantepec,—the artificial portion of which should be 50 British statute miles long, and its dimensions, in other respects, similar to those of the Caledonian Canal,* with locks, reservoirs, aqueducts, &c., &c.,—would exceed £6,000,000 sterling. If 4000 labourers were employed on such an undertaking, and worked 280 days in the year,† they would be 10 years completing it. As there

* That is, 122 feet wide at top, 40 feet wide at bottom, and 20 feet deep.

† In Mexico population is scanty, and labour cannot easily be obtained: it is true foreign labour might be introduced, but at heavy cost, even if the climate did not prove unsuitable, so that in rating the number of working days throughout the year so high, we have left but small margin for the effects of climate or of casualties.

would be an accumulation of interest however, upon the instalments called up while the work was in progress, it should be added to the capital (which we are content to take at £6,000,000 sterling only); at 5 per cent. per annum then, for 5 years,* there would be an accumulation of £1,500,000 of interest, which together with the actual outlay, would constitute a *bond fide* capital of £7,500,000, which should yield not less than 10 per cent. upon £6,000,000, and 5 per cent. upon £1,500,000, or £600,000 and £75,000 annually. Thus an income of £675,000 would be necessary to uphold dykes, dams, locks, sluices, aqueducts, and reservoirs; keep the natural as well as the artificial portions of the canal in order and free them and the bars at their extremities from deposit or other obstruction; defray the expense of steam tugs and of the establishment generally; and pay a moderate dividend to the shareholders. How are those conditions to be realized? Let us examine.

In a return published by order of the French government,† it is stated that the aggregate amount of tonnage which traded to the Indian, China, and South Seas, during the year 1839, was 995,030 tons; if to that be added the annual amount trading from Europe and the United States to the west coast of South America, we shall arrive at a total of 1,100,000 tons nearly, comprised in the shipping trade to and from the Indian and Pacific Oceans and the China Sea. If two-thirds of that amount‡ paid "toll" to the canal, at the

* The whole capital would not be paid at once, or at the commencement of the enterprise; we calculate the interest, therefore, for 5 years only.

† In the "*Bulletin du Ministre de l'Agriculture et du Commerce*," for April, 1842.

‡ We have elsewhere attempted to shew that vessels of considerable burthen could not cross the bar of the Coatzacoalcas; and it is well known that the greater portion of the ships which trade to the East Indies are upwards of 600 tons—many too, of a smaller class, would still continue to double the Cape of Good Hope, from the circumstance of its affording a shorter passage to the ports for which they might be destined.

rate of three dollars per ton,* an income would be realized of £440,000, which would be £235,000 *less than the sum required*. Are capitalists likely then to adventure their wealth in such an enterprise? We fancy not! And as a communication by this route, partly by land, partly by water, would present almost as many physical difficulties as a canal, but much fewer advantages, we shall not tarry to discuss the merits of such a project, but shall hasten to investigate the capabilities of the next portion of territory referred to in these pages.

* The rate suggested by Chevalier is two dollars per ton.

CHAPTER IV.

A GLANCE at the map of central America leads us to infer that few portions of the Great Isthmus are so favourable for the formation of a ship canal as the Province of Nicaragua.

The large river and convenient harbour of San Juan, on the Atlantic shore, the lakes of Nicaragua and Leon, situate within the line of country usually considered as best adapted for transit through this province, from the circumstance of its appearing to shorten, as it were, the distance to be excavated, and from the fact likewise of the lakes being available as exhaustless feeders to a canal—the safe and spacious harbour of Realejo; (to say nothing of the less eligible port of San Juan del Sur)—these singly or conjointly present facilities for establishing a water communication across this portion of America too important to be overlooked; and as the success of such an enterprise must greatly depend upon the capacity and position of the ports at its command, the province of Nicaragua undoubtedly possesses advantages in these respects, the weight of which cannot be denied.

We are informed by an enterprising American traveller (Mr. Stephens) in his interesting work on central America, that according to a survey made by Lieut. Bailey, R. M., several years ago, at the instance of the Government of central America, “The length from the Pacific to the Lake of Nicaragua is $15\frac{1}{3}$ miles, the sum of the ascents 1,047 ft., 5 in., 45 dec.; the sum of the descents 919 ft., 2 in., 4 dec.; the difference (128 ft., 3 in., 05 dec.) being the height of the lake above the Pacific Ocean at low water.” We learn, likewise, from the same competent authority, that the Lake of Nicaragua is 95 miles long, about 30 miles wide at its

broadest part, and that its average soundings are about 15 fathoms. The River San Juan, with all its windings, is said to be 79 miles from the lake to the sea, without cataracts or falls (the only obstruction being from rapids), and navigable at all times for *piraguas*, drawing from 3 to 4 feet water.

Having occasion to visit San Juan de Nicaragua in January last, we became acquainted with an old resident (Mr. Peter Shepperd), who for many years navigated the lakes of Nicaragua and Leon, as well as the river San Juan, for purposes of traffic with the inhabitants of the country.

Mr. Shepperd (who is a shipbuilder as well as a seafaring man), supposing it might be profitable to employ a small vessel on the lake of Nicaragua, constructed one at Jamaica several years ago of 52 tons burthen, and drawing 3 feet water only at its lightest draft.

In November, 1826, the end of the rainy season, when the waters of the river should have been nearly at the highest, Mr. Shepperd began to ascend the San Juan in his little vessel; but it was not (he informed us) until twenty-two days of hard labour (eighteen of which were employed warping against the current with a small boat ahead to sound) that he succeeded in floating his shallop on the lake.

Mr. Shepperd's experiment furnishes a practical (but not a favourable) comment upon Mr. Bailey's statement, *that the San Juan is navigable at all times for piraguas drawing from 3 to 4 feet water.*

Mr. Shepperd observes of the river San Juan, that in many parts it is rapid and shallow; that there is a ledge of rock extending across the channel about half way between the town of San Juan* and the lake of Nicaragua; and that when loaded *bongos*† ascend the river in the dry season, it is necessary to unload, haul them over the ledge, and reload them, before they can reach the lake. A similar custom

* The name of this town has been changed to Grey's Town.

† Large canoes for carrying cargo.

prevails during the dry season in the river Chagres, and if the resemblance between the two streams in other respects obtain, we think it probable that the best and most economical mode of water transit across the province of Nicaragua would be secured by cutting a canal which should be fed by the waters of the San Juan and of the great lakes, as it is probable that the primary expense of rendering the river navigable would be nearly as great as that of cutting a canal; and the subsequent outlay to prevent it shoaling, and to keep it free of trees and other impediments to navigation, would perhaps exceed that which might maintain a canal.

Mr. Shepperd emphatically pronounces the San Juan "unfit for purposes of navigation," and in that opinion M. Chevalier would seem to concur when remarking on the question of a canal to admit ships as large as those which enter the north of Holland or the Caledonian canal (large class Trans-Atlantic steamers for instance): he observes,* "To attain this end, it is very possible it might be requisite to abandon the navigation along the bed of the river for a considerable portion of the course of the San Juan and dig a canal in a lateral direction."

"The Lake of Nicaragua," says Mr. Shepperd, "has 15 fathoms water *in some parts only*; at its junction with the San Juan it has *but 7 feet, the shallow water extending a long way into the Lake.*" These statements likewise differ from Lieut. Bailey's, but whether they are right or whether they are wrong is comparatively unimportant to our present purpose, as it is not upon such considerations that the question of preference as regards the advantages of this or that locality for intermarine transit is likely to hinge.

"From shore to shore," says Chevalier, "the distance between the two oceans, measured at the port of San Juan,

* "Pour attendre ce but, il serait fort possible qu'on fût obligé de renoncer à une navigation en lit de rivière sur une bonne partie du cours du San Juan, et qu'on dût creuser un canal lateral."

is 150 kilometres (about 94 British statute miles); from San Juan de Nicaragua obliquely to San Juan del Sur (on the Pacific), it is 250 kilometres (or 156 British statute miles); and to Realejo upwards of 400 kilometres (250 British statute miles), as the 'crow flies.' ""*

If we adopt the line from San Juan de Nicaragua to San Juan del Sur, the cost of a ship canal (according to the estimate given by Mr. Stephens) would be from 20,000,000 to 25,000,000 dollars (between four and five millions sterling!); and should that estimate not have been understated (which from the result of our analyses of former calculations of the sort we are inclined to doubt), it is still sufficiently large to deter capitalists from the project, the length of time necessary to complete it being so considerable (in a district where the population is scanty) as to double the original cost by an accumulation of interest, unless large bodies of foreign labourers were introduced into the country, the expense of which would be enormous.

The sea port of San Juan del Sur is (as we have already observed) an indifferent one, and does not offer such accommodation for vessels of large burthen as is indispensable to the success of a ship canal transit; and if to obviate the inconvenience we trace a route from the mouth of the San Juan into the Lake of Nicaragua, and following the River Tipitapa into the Lake of Leon, pass near the city of that name, and debouch into the fine harbour of Realejo, we shall secure a suitable port in the Pacific; but the line being much more extended, the expense would be proportionately augmented.

The difficulty of forming a railroad or a M'Adamized carriage road across the province of Nicaragua, is so manifest from the extent and nature of the country to be traversed, as to render comment thereon superfluous. Moreover the territory of Nicaragua and of central America generally is volcanic, and subject to destructive earthquakes.

* "*Toujours a vol d'oiseau.*"

CHAPTER V.

WE have now to treat of the Isthmus of Panamá, and the fact of the distance between the two great oceans being much less thereabouts than at the other points indicated, is one of the reasons of the preference which public opinion has usually accorded to that district, as the site for a line of transit from shore to shore.

In November, 1844, the writer of these pages, being about to proceed on a visit of inspection through the stations of the Royal Mail Steam Packet Company in the West Indies, was instructed "to obtain such information as might be useful in guiding the Directors to a sound opinion as to the practicability of influencing the transit of passengers, specie, &c., between Europe, North America, and the Pacific, making the same pass through the Isthmus of Panamá, instead of by the route round Cape Horn."* With this object he embarked on board the Company's schooner 'Liffey,' at Kingston, Jamaica, on the 16th January last,† accompanied by Mr. M'Geachy, Crown Surveyor of Jamaica, and landing at Chagres, commenced an exploration of the Isthmus of Panamá, which lasted about a month. The reports of the examinations were transmitted to the Secretary of the Royal Mail Steam Packet Company, for the information of the

* Although the honour of being the first to construct a railroad from the Atlantic to the Pacific Ocean may possibly attach to citizens of the United States of America, the Royal Mail Steam Packet Company are undoubtedly entitled to some share of public consideration for restoring a valuable communication, which had been almost abandoned since the period when the Isthmus of Panamá was occupied by the Spaniards.

† In the year 1845.

Directors, but as their insertion in these pages may prove interesting, we shall repeat them at length, and, at the same time, introduce an amusing letter, with which we were lately favoured by Mr. Perry, Her Britannic Majesty's Consul at Panamá.

“ Kingston, Jamaica,

“ 23rd March, 1845.

“ Sir,—I have the honour to acquaint you, for the information of the Directors, that I landed at Chagres on the 30th January last, accompanied by Mr. M'Geachy, Crown Surveyor of Jamaica, and I immediately proceeded to carry out the orders of the Court relative to the Isthmus of Panamá.

“ In addition to my own, I beg to hand you Mr. M'Geachy's report of the explorations made; and as our labours commenced at Chagres I shall, begin by describing the bar and port of that name.

“ The bar of Chagres is divided into two narrow channels by a bed of rock, upon which the sea generally breaks at low water, and during gales of wind (from the Westward and Northerly to N.N.E.) the surf is so heavy at all times of tide, as to render the passage of the bar, in open boats or canoes, both difficult and dangerous. An instance occurred under my observation, when twenty people were nearly lost.

“ The rise and fall of tide upon this bar vary from one and a half to two feet, as the wind prevails on or off the shore. In the eastern channel I found a depth of 13 feet at low water, spring tides,* but that although the deepest and best of the two channels is so narrow as to render it perilous for a steamer, drawing 9 or 10 feet water, to attempt it during a fresh gale with a heavy sea; as, in addition to the risk from the '*heave and set*' of the sea, the least deviation from the deepest part of the channel would cause her to strike, and incur serious damage, if not total wreck.

* I sounded at the end of the rainy, or rather, at the beginning of the dry season, when the river was full.

“Sailing vessels, bound into the port of Chagres, generally enter by the eastern channel, and they require a brisk leading wind to carry them through it, (the set of the current being in the direction of the rocks;) for were the breeze to fail, (which it sometimes does under the castle point,) they would be in imminent danger of striking upon them.

“Shipwrecks are not uncommon in Chagres Roads. While I was there, an American schooner, (the ‘Rocket,’) dragged her anchors, was driven ashore, and lost.

“The Port of Chagres is essentially an inconvenient port, it is from five to six fathoms deep in some parts, but very shoal in others; the anchorage, moreover, is so narrow, that a steam vessel of moderate length could not swing there at her moorings; to be always ‘water bourne’ she should ‘moor stem and stern.’ In the rainy season, however, large trees are sometimes swept down the river by the current, and carried ‘athwart hawse’ of vessels moored off the village, thus they are liable to be driven from their anchors, and if they drift upon the bar they probably go to pieces.

“To enlarge the Port of Chagres, and render it permanently eligible for the general purposes of commerce, would be a work of great and constant labour and expense; powerful dredging machines would have to be applied, and to answer fully they should be worked by foreigners; to that condition the climate would prove an obstacle, and if they were left to the natives, the machinery would get out of order, and the dredging be neglected.

“I have heard that it has been suggested to blow up the rocks, which divide the bar, with gunpowder, and throw both channels into one, which should be deepened and rendered navigable for vessels of greater draft than either of the present channels are. I doubt, however, if such a project could be realized without the constant use of the dredging machine; for although the rock is of sand-stone formation, and might be ‘blasted’ and the fragments removed, yet

by widening and deepening the passage, the current would be diminished, and deposit increased; thus the bar would gradually shoal and the anchorage become more narrow through the extension (which the additional deposit would cause) of the mud flats, on either side of the port; the experiment therefore of improving the bar would probably be a failure.

"About a league to the westward of Chagres is Limon (or Navy) Bay,* which could not be made subservient to purposes of transit, except at vast outlay.

"This bay is a wild and open roadstead, offering little or no protection from the sea: a vessel caught there in a hard gale from any point between W.N.W. and N.N.W. must ride it out or go ashore; and gales of wind are not unfrequent thereabouts in the winter season—those from the points indicated being the most violent of any which prevail there. I experienced a northerly gale off Chagres, in the Company's schooner 'Liffey,' upon which occasion a very heavy sea was thrown in upon the coast.

"To make Limon Bay available for shipping, a breakwater would be requisite, a mile to a mile and a half long, and extending from the beach into five fathoms water; a canal, moreover, would have to be cut, four or five miles, to unite the bay with the River Chagres.

"The sea front of a breakwater in Limon Bay would be exposed to the utmost force of the 'Norths' upon that coast, and liable to damage from the heavy sea; consequently, it would be likely to require frequent repair: its original cost, therefore, (vast as that might be,) would not involve the only consideration,—large sums would have to be employed annually to uphold it.

* It is stated that the American engineers employed to survey the Isthmus of Panamá (with a view to the establishment of a railroad from the Atlantic to the Pacific Ocean) have decided to fix their northern terminus at Manzanilla Bay, which is about a mile to the eastward of Limon Bay.

"Were I reduced to the alternative of choosing between Limon Bay and Chagres Roads as places of anchorage, I should prefer the latter, for, by 'coming to' in a proper position (prepared to slip), I should feel confident of clearing the land under canvass in most cases (in a tolerably handy vessel), whereas, were I at anchor in Limon Bay, in a hard gale from any point from North to W.N.W., my position would be critical indeed, if my anchors dragged, or if my chains parted, for it would be scarcely possible to work out under sail alone (so heavy is the sea that rolls into the bay), and clear the dangerous reef on Point Toro on the one hand, and that on the north-eastern point on the other.

"I have now concluded my observations upon the bar and port of Chagres and the Bay of Limon, and shall proceed to give an account of our *reconnaissance* of the River Chagres from its mouth to the town of Gorgona. I shall also briefly touch upon the character of the country thence to Panamá.

"We ascended the Chagres in a large canoe, taking the bearings of the different 'reaches' or '*calles*' as they are called by the natives, and estimating their length in chains. Mr. McGeachy took the bearings and I checked them with a prismatic stop compass. We sketched in our field book the bends of the river, the forms of islands, shapes of hills, &c., &c., and marked down every prominent feature that came under our notice. We sounded also with care, noting our observations upon the depth of the stream,—its strength, the reaches where it is shallowest, and the height to which it rises when floods prevail (as is not unfrequently the case), and overflow its banks and much of the adjacent country.

"The Chagres is navigable to Palo Matias (about a league above its confluence with the Trinidad), at all seasons, for vessels drawing 5 feet water; but there is a sharp bend in the river thereabouts, where the channel though deep is rapid, and so narrow that a very small vessel only could pass it, and

she would be unable to proceed much farther, as in the next reach the shallows commence.*

"I am unable, at this moment, to report so fully upon this subject as I could wish, our notes being in Mr. Mc Geachy's possession; drawings are, however, in course of preparation from them, which, when finished, will be sent to England with the notes themselves for the inspection of the Directors.

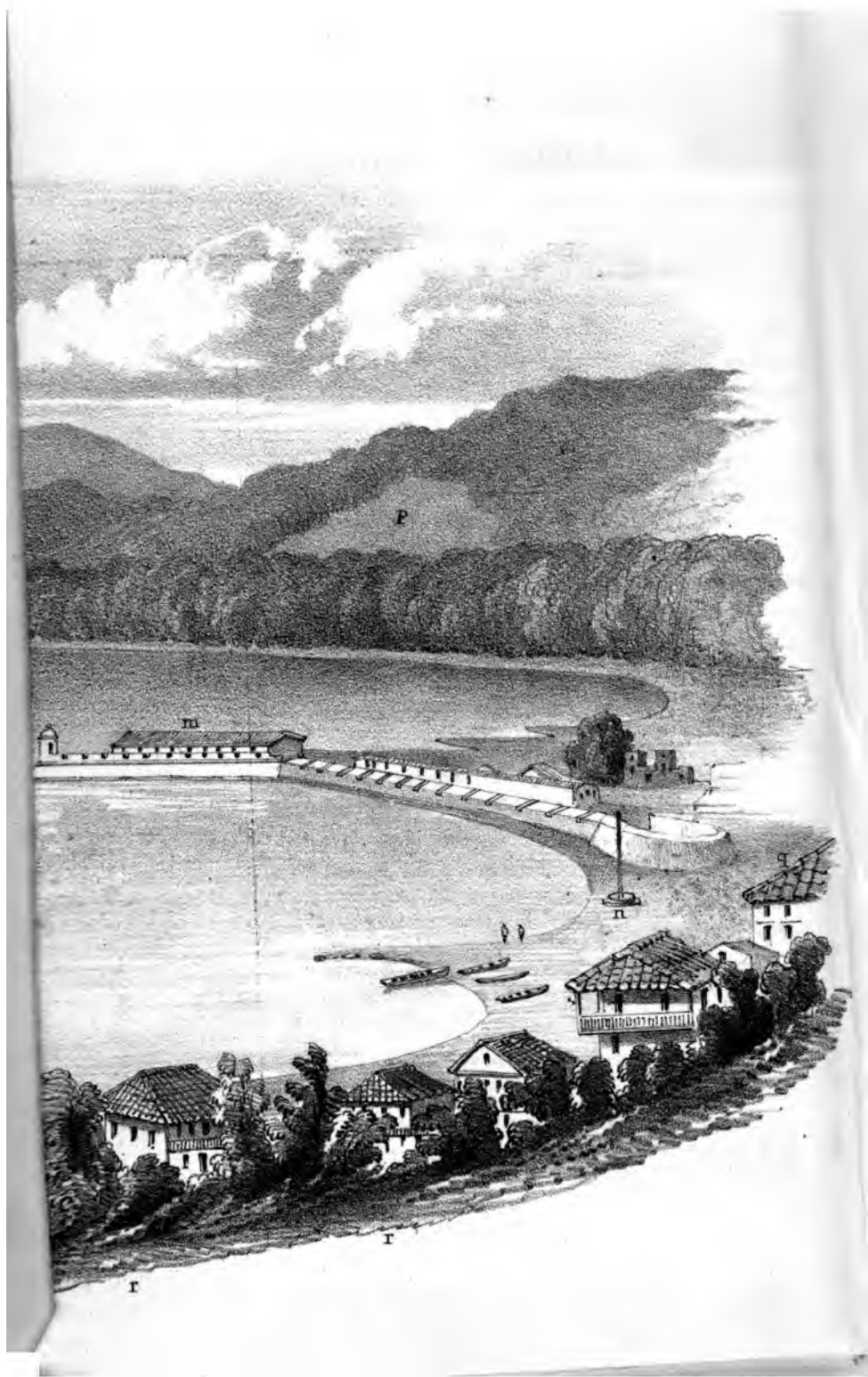
"I am satisfied that the River Chagres could not be made available for purposes of transit by canal, or otherwise, (on an extended scale,) except at an expense vastly disproportionate to the advantages which would be gained, and were the bar thrown open to vessels of burthen, and their river passage assured as far as the mouth of the Trinidad, the expense of cutting a ship canal thence to Panamá would be greater than the prospect of return would justify. As regards a railroad or a M'Adamized carriage road, a considerable portion of the country through which it must pass, would be flooded during the rainy season, (when the waters of the Chagres rise, at times, to the height of 30 feet above their ordinary level), its foundations sapped perhaps, and the transit brought to a standstill.

"To clear this river of trees, sandbanks, and other obstructions, and keep it constantly navigable as far as Gorgona for steamers of a light draft of water (of 3 feet draft, for instance), would be a work of great and constant labour and expense, and should not be undertaken with the hope of profit. Steamers of such limited draft, moreover, would be suitable for river navigation only, and although transshipments from them to vessels anchored off the bar, and *vice versa*, would be necessary, it might not always be practicable, during the

* "In some parts of this river I have since found not more than *fifteen inches water*; when that occurred the canoe men waded into the stream and dragged the canoe along until they found deeper water."

PLATE N°2.





REFERENCE TO PLATE No. II.

- A. Entrance to the Harbour.
- B. The point to seaward, on which there is an old battery.
- C. Fort St. Jago.
- D. An indentation of the Harbour, where there is a small settlement; to the right of it there is an old fort, called in the charts Fort St. Fernando; it is not visible, being hidden among the trees and bushes.
- E. Rocks, which extend from E. to the point B.; the shore is bold, the water there being ten fathoms deep.
- F. A rocky point, round which is the careening place formerly used by the Spaniards.
- G. The spot where vessels used to be careened. Old inhabitants of Portobélo state that ships of the line were careened here when the Harbour was more frequented: the passage round the point F. is nearly filled up, but might be cleared if required. Some charts represent the existence of an opening or narrow channel between this careenage and the sea.
- H. High ground which looks like an island.
- I. Shoal water.
- K. Mouth of the River Cascajal, which is of some magnitude. I ascended it about a mile, and found deep water; it is from 60 to 100 feet wide; from its mouth, for about a quarter of a mile, the banks are firm; during floods, however, large trees are swept down the river, and many of them become embedded at its mouth; the inhabitants of Portobélo use these trees for firewood.
- L. A ripple seen across the Harbour, where the shallow water terminates. Within the ripple, about the mouth of the river, the water is very shoal and to the right (about and opposite the Fort) it is also shallow. Sir Gregor M'Gregor commenced filling it up.
- M. Fort Jeronimo.
- N. Remains of the Flag Staff.
- O. A break in the hill side, shewing reddish soil.
- P. Where the wood is cleared and a plantation commenced.
- Q. The site of what used to be the Government House, but is now the Custom House. The town extends away to the right, and below this point to the base of the hill; several rivulets run through the town, and are crossed by bridges. The streets are paved and the houses tiled.
- R. A part of the town.
- S. A projecting point, on which there are the remains of an old battery. To the left (extending in the direction T. T. T. T.) there is a desirable spot for the construction of a wharf, or pier; the water is sufficiently deep for the largest ships.
- T. T. T. T. Direction and extent of a proposed pier.
- U. U. U. U. The hill (about 100 feet high) where the Sketch of the Harbour was made.

stormy season of the year, to make them. Steamers stationed on the river, moreover, would soon, (I fear), get out of order, as from the unhealthiness of the climate it would be difficult to keep them manned except by the natives, whose training has not yet qualified them to serve with effect in steam vessels.

"The country between Gorgona and Panamá seemed practicable for a carriage road, but as that is a question with which Mr. M'Geachy is more competent to deal, and upon which he has dwelt in his report, I beg to refer to that document for information on the subject.

"The moment we had finished the examination of the bar and port of Chagres, I became apprehensive that some other direction must be given to a transit across this Isthmus than the line of the Chagres to Gorgona or Cruces, and thence to Panamá; that impression was confirmed by the time we arrived at Gorgona, and after reaching Panamá an exploration was resolved on to determine whether a good carriage road might not be practicable between that city and Portobélo. This important operation was confided to Mr. M'Geachy, who went to Portobélo in one direction, and cut his way back to Panamá by compass in another; satisfying himself (after 15 days of laborious examination) that the country would admit of a carriage road that should avail at all seasons of the year. Portobélo and Panamá were fixed upon as the *termini* of the line, because of the shelter they offer for shipping; and having myself examined those ports, I am satisfied that the largest vessels might safely ride at Portobélo, and that although the bay of Panamá is not a harbour (properly so called), it answers all the purposes of one, being rarely visited by strong winds and sheltered by clusters of islands, the nearest of which are two or three miles only from the mainland, and form a good and secure anchorage; the rise and fall of tide, moreover, in this bay is from 18 to 24 feet, which renders it (especially about the mouth of the Rio

Grande and the Island of Toboga) available at small cost for some of the most important purposes of shipping.

"If a transit communication were decided upon from Chagres to Panamá, it must be partly by water, partly by land, (unless a ship canal were made,) and would create the necessity of a passage of thirty miles by sea to Portobélo, as well as a transshipment; for as Chagres roads are much exposed, transfers of merchandize upon a large scale could not take place there without great risk and inconvenience; it would be expedient, therefore, to make them at Portobélo instead.

"I consider (as does Mr. M'Geachy likewise) that the most practicable and economical mode of transit across this Isthmus would be a good M'Adamized carriage-road from Portobélo to Panamá; it would require to be from 50 to 55 miles long, and might be so formed as to be convertible into a tram-road if necessary; at either terminus there would be a good port, and at Portobélo vessels of any burthen could discharge or load alongside a wharf run out a few yards from the shore, whereas in Chagres roads there is the constant disadvantage of an ocean swell, however calm the weather be, and whenever it should be necessary to tranship there, the want of shelter might be felt. Moreover, the maintenance of river steamers would be expensive (if practicable), and we should gain nothing by making our *rendezvous* in Limon Bay unless we erected a breakwater there, the cost of which would be four or five times as much as might suffice for a first-rate carriage road from Portobélo to Panamá.

"To encourage the construction of such a road the Government of New Granada have offered to parties who may be willing to undertake it, a free grant of nearly all the land through which the road would run, and the small portions which it might be requisite to purchase could be secured at trifling cost. Labour, therefore, would constitute the chief

element of outlay, and as it is requisite I should convey some idea of the facilities for obtaining it on the Isthmus, and of the probable expense of making a M'Adamized carriage-road across that territory, I beg to state that, as regards the first, there is reason to suppose 2,000 labourers could be hired in and about the province of Panamá; with reference to the second point, I must admit that my calculations are not complete, although I believe £400,000 would be ample for every purpose.

"To Mr. Lewis (who has resided many years at Panamá) I am indebted for the statement upon which I base my estimate of the number of labourers to be obtained. I have also to thank that gentleman for much valuable information relative to the traffic a carriage road would be likely to open out, and which he thinks would soon realize an income of from £60 to £70,000;* with the probability of doubling it in ten years. The privilege offered to a road company, moreover, by the Government of New Granada, to purchase 700,000 acres of land in the Republic at an almost nominal valuation, might prove at no distant period as remunerative as the road itself.

"I cannot close this Report without expressing the obligation I feel under to Mr. Perry, H.B.M's Consul at Panamá, as well for the information as for the assistance and attention he afforded me. Of Mr. M'Geachy also I must record my high opinion; we acted together with unvarying cordiality, and without his valuable aid my own endeavours would have been useless.

"I have the honour,

"&c., &c., &c.,

(Signed) "W. B. LIOT.

"General Colonial Superintendent,

"Royal Mail Steam Packet Company."

* See Appendix.

“ Kingston, Jamaica,

“ 17th March, 1845.

“ Sir,—I have to report for your information my opinion of the general features of such portions of the Isthmus of Panamá as we lately explored, with a view of ascertaining if it might not be practicable to construct a Macadamized carriage-road suitable for purposes of transit from the Atlantic to the Pacific Ocean ; I shall also state what line of country I think likely to offer most facilities, and the greatest advantages for attaining the end proposed.

“ Of the four lines explored I shall commence with that which lies between Chagres and Panamá, and is to be traced up the River Chagres to Gorgona, and thence by land in a direction bordering upon the present road from Gorgona to Panamá.

“ Having carefully noted the physical formation of the country adjacent to the banks of the River Chagres, I am of opinion that there are difficulties along that principal portion of the line which preclude all hopes of a durable carriage road being formed there. These difficulties consist in the low swampy nature of the land near the river in some parts, and the extraordinary floods and extensive overflowing of its banks in others. The country, therefore, from Gorgona to Panamá, although not impracticable in itself, is rendered unavailable from the circumstances mentioned.

“ The second line from Chagres, Gorgona, Cruces, and Panamá, you will at once perceive must be liable to objections similar to those which have been urged against the first line ; for although the country from Chagres to Panamá might be made serviceable, yet the obstacles opposed by the River Chagres are so many and formidable, as to be fatal to the plan for forming such a communication as could alone be wished for, or deemed secure at all seasons of the year for purposes of conveyance from sea to sea. In addition to the foregoing objections, I consider the port of Chagres in itself

one of the greatest hindrances to any operation connected with the river of that name, not only from its dangerous bar, shoals, &c., but likewise from its very circumscribed limits when entered, all of which drawbacks must have necessarily struck you, and upon which you will of course have made your own remarks.

The third and fourth lines explored, lie between Panamá and Portobélo and were examined, the third line while I was going from Panamá to Portobélo, the fourth line while I was returning from Portobélo to Panamá.

"The third line runs in a northerly direction to the heights of Maria Enrique, past San Juan and Juan Lanas, and between the Boqueron and Piqueni rivers, when, taking a north-westerly course it passes under the heights of Santa Clara and by the Rio Cacaíal generally, and ends at Portobélo, covering a distance estimated at 50 to 55 miles.

"This track is favourable to the formation of a carriage road, that shall be available at all seasons of the year.

"The only formidable rivers to be crossed would be the Chagres and Piqueni, and for that, suspension bridges would be required of a span not exceeding 250 feet, I should hope, when a minute survey and examination of the ground shall have enabled us to select the points most favourable for this purpose. Several other bridges, varying in space from 10 to 40 feet, will be necessary over rivers, rivulets, and springs, which, inconsiderable in the dry, are impassable during the wet season. The bridges might be made of stone or the hard woods of the country—both of which are to be obtained on the spot.

"The elevations throughout the country traversed are of a nature to admit of such gradients and inclinations being preserved, as are characteristic of a good carriage road. The land is generally undulating, and with the exception of a portion next to Panamá, almost entirely in high standing wood, which will render a very careful survey necessary, before the most advantageous line can be decided on.

“There is variety in the nature of the ground to be cut through, both as regards rocks and soil, and the slopes of the hills. The road in some parts will require deep paving and good metal covering, but there is rock generally on the line sufficient in quantity and quality for these purposes.

“The fourth and last line examined was from Portobélo in a southerly direction, towards the juncture of the Rivers Chagres and Pequeni, (where it joins the third line.) This line runs entirely through high woods and passes over an undulating country, regarding the elevations of which it is extremely difficult as yet to form an opinion, whether it or the third line should be preferred: in all other respects it is very similar to the third line, but having the appearance of being shorter will, on that account, deserve particular attention.

“Of the four lines examined, I am of opinion that either the third or fourth should be adopted, if the work is to be commenced upon; but in an undertaking of such importance, nothing should be done in execution of it, until a most rigid, careful, and critical examination, and detailed survey of the country, have been made, in all cases seeking the firmest ground and lowest levels consistent with the proper direction of the road required.

“The termini of this line must obviously be at Panamá and Portobélo, which harbours possess a greater combination of advantages than any others along this coast; your own professional knowledge, however, and opportunities of judging on the spot, will enable you to give an opinion on those points, necessarily of greater value than mine can be.

“In conclusion, I have to state that I do not foresee any extraordinary difficulties in the construction of the proposed road, and the best assurance I can give of the sincerity of my opinion, is an expression of my readiness to undertake the execution of the work as well as the survey, if required; and I make the offer, confident of my ability, to complete a

road of the first order, as regards strength and durability, and which shall at all times be available.

Possessing as you do so much general as well as particular information on this subject, I trust I have, for the present, said enough, and will detain you only to observe, that I shall furnish you with drawings, as soon as I can have them prepared, of the lines of road examined, between Panamá and Portobélo; from them a better idea may be formed of the country to be operated in, than a mere written report is likely to afford. I shall now express a hope of seeing this universally approved and noble undertaking fully and speedily carried out, and

“Have the honour to be, Sir,

“Your most obedient servant,

“E. M'GEACHY,

“*Crown Surveyor, Jamaica.*

“Captain Liot,

“General Colonial Superintendent,

“Royal Mail Steam Packet Company.”

“Panamá, June 21st, 1845.

“I am just returned from a very agreeable excursion I have been making on the Portobélo road, in company with Colonel Herrera* and Don Juan Ansoategui.

“I promised M'Geachy that I would examine and report as to the state of the road and rivers some time during the rainy season; I decided therefore upon taking the ‘*veranito*† of San Juan,’ when there is generally a cessation of rain for a few days.

“We started on Monday last, and returned yesterday. During that time we saw as much as could be expected from

* The then Governor of Panamá and the present Minister of War at Bogotá.

† Short summer.

men who are not land-surveyors. My friend, the colonel, is fond of shooting, and I, as you know, have rather a botanical turn; and both of us had ample reason to be satisfied, he having fallen in with several flocks of wild turkeys, some pheasants, partridges, and deer; for my part I brought home a mule-load of curious *orchidaceæ* and plants of the cactus tribe, in full flower.

"By the bye, we never took it into our calculations that should a road ever be made over these hills, an active passenger might easily pay not only his intermarine expenses, but those even of his trans-atlantic voyage, by picking up '*Peristeria elata*,' which have been sold, I am assured, as high as a guinea a bulb. The woods are all virgin to botanists, for I know of none who have passed that way, and it is really worth a trip by one of your steamers to any *aficionado*: I may say the same to any sportsman, who may shoot as many turkeys in their proper *habitat* as he pleases, and much more than I should like to carry.

"With respect to the road, which perhaps interests you more than air, plants, or turkeys—although I pity your taste if such be the case!—I must pronounce a most favourable opinion, and I have two credible witnesses to bear me out. It is perfectly transitible with a mule or horse at this season of the year, and after several weeks of heavy rain. This road in fact is infinitely better than the Cruces or Gorgona roads in the middle of summer; it is less stony and has no swamps.

"Juan Lanas was my head quarters, and I made an excursion on the River Piqueni as far as where it enters into the Chagres. We forded both these rivers several times with the greatest facility, and from all the inquiries I made, it appears that the road and rivers remain very much in the state we found them, until the heavy and continued rains of October and November,—the month of December being the worst of the year *quoad* the state of the road. This is natural enough, but it is all better than I expected to find it, and as

far as we went I am convinced there can be no difficulty in making a road, which will pass over one of the pleasantest and most beautiful countries I ever saw. A place called Capireja, belonging to S̄or. Pedro Ycaza (the owner of Juan Lanas), is situated 4 hours up the River Piqueni, and is about half-way to Portobélo; from thence the canoes descend very easily in five hours to a place on the River Chagres called "*el Puerto*," and it took us seven hours to ride thence to Panamá.

"I maintain, then, that even in the present state of things the journey can be made much quicker from Portobélo than from Chagres; as in the former case you descend a river, and in the latter you ascend one.

"I am only surprised that this easy communication has been so long neglected, as it appears from the remains of two different '*Chaussées*' that it was much frequented by the Spaniards. I am not aware if our friend, M'Geachy, was informed that from Caimitillo to St. Juan there was formerly a direct paved road, shorter than the present one and avoiding one of the rivers; it is now closed, but it ought to be visited at once should it be decided to survey the country: it is probably the old Spanish road, and in my opinion much might be gained by exploring narrowly the old track. The Spaniards had good surveyors and architects in those days, as may be seen by the handsome ruins and walls which still remain in this city.

"I was very much tempted to have gone on to Portobélo, but was obliged to return to despatch the mails.

"During my excursion on the Portobélo road I did not omit to make inquiries respecting the estates the road would have to pass, and of their approximate value.

"From Algarobo to Juan Lanas the property is held by three or four individuals, who would probably be glad to sell for the value of the cattle on them, with a small addition for the land. Towards the vallies of the Chagres and Piqueni

rivers, several of the grass farms are provided by nature with summer fodder of a very singular kind: I could not help remarking the superior appearance of the cattle there to those I had left on the hills near the city, and upon asking the reason, I was informed that during the summer or dry season they leave the savannahs (magnificent when I saw them), and go to the banks of the rivers to feed on figs, quinces, and candles! (*higos, membrillos, y velas!*) I could not swallow the candles, but soon saw the origin of the name; a kind of shrub growing on the banks of the rivers and rivulets produces a fruit so like a candle that any person might be deceived by it. This plant grows in the greatest abundance, and the cattle are exceedingly fond of it, as they are of a sort of fig-like fruit, which grows also in the greatest abundance, but which bears no relationship to the fruit of that name in the south of Europe; nor is their wild quince at all like our quince in its interior, for it opens more like the bread fruit, and is of so nutritious a nature that not only cattle but pigs and poultry are fattened with it. This fruit grows on large timber trees, and we passed under their shade for some miles.

"You will confess that nature has been sufficiently bountiful in this long-neglected but beautiful country, and you will join me in the wish that its wonderful resources may ere long be taken advantage of. I may mention that good steers from Nata may be had (landed here) at from 6 to 6½ dollars; fatten them if you please with candles and quinces, ship them from Portobelo to Jamaica in small cattle steamers, and they would leave a good profit, or I am much out of my reckoning. The Spanish race (I mean of men) are not fond of husbandry, and prefer some trumpery Government employment, which gives them about £200 per annum, to the more noble and ancient task of tilling *grata tellus*, which never deceives her votary.

"One of the estates we passed took us three hours to

traverse, riding as fast as Murillo* could walk; it formerly possessed a sugar-mill, and a very fine cocoa as well as a coffee plantation; all these have been allowed to fall to ruin, although the cocoa trees still yield their fruit for the benefit of the monkeys.

“General Mosquera has issued a very favourable decree respecting the national roads, and Congress has granted him ample faculties to treat, should any company offer, with a reasonable hope of carrying out the work. I enclose you the paper containing the decree.

“General Mosquera has likewise ordered a body of sappers to be formed in this province, whose duties will be to attend to the roads and to the repair of the walls.

“Congress has decreed that a salary of 3,000 dollars shall be offered for a foreign engineer (*of ponts et Chaussées*), with several assistants at salaries of 1,500 dollars each, and 100,000 dollars per annum have been voted for making national roads, but this I fear would be as a mere drop of water in the ocean, where such an immense tract of country has to be traversed. However all these matters look well, and if the country remain in peace during General Mosquera’s reign, we may expect to see some signs of improvement at the termination of the four years of his presidency.

“Believe me, &c.,

(Signed) “WILLIAM PERRY.”

* The guide who accompanied Mr. M’Geachy to Portobélo.

CHAPTER VI.

THE preceding Reports inform us that the bar and port of Chagres present obstacles to the establishment of a proper line of transit in that locality which cannot be advantageously overcome; and Mr. Perry's letter confirms Mr. M'Geachy's statement, that a good carriage road from Portobelo to Panamá is not only practicable, but might be comparatively easy of achievement.

Let us, however, suppose the formation of a ship canal resolved on (and as a mere labour or as a work of art it could present no overwhelming difficulty) to unite Limon Bay with the River Chagres, and the latter (by its confluent, the Trinidad) with the bay of Panamá, establishing a continuous water communication from the Atlantic to the Pacific Ocean for vessels of the largest class; let us then consider the time which might be required, and the extent of outlay necessary to accomplish it.

To make a ship canal of the requisite capacity from the bay of Panamá to Limon Bay, the artificial portion must be about 40 miles long, not less than 120 feet wide at top, 50 feet wide at bottom, and 22 feet deep. To complete it with 2,000 labourers (the number which we have elsewhere observed might be hired within the province of Panamá and its vicinity) a period of 18 years would be consumed, and although that term might be abridged by the introduction of foreigners, it would augment the expense considerably, and increase to a fearful extent the chances of mortality among the workmen.

In our previous estimates of progress and expense, we have calculated that 280 might be the average number of

working days of each labourer annually; those persons, however, who are acquainted with the Isthmus of Panamá, must be conscious that no such average could be realized in a country where the climate is insalubrious, and where the natives even are unable to support prolonged exposure to the continuous and heavy rain which prevails during a dreary and protracted "wet season;" but if the fall of water then be great, the drought is often excessive during the "dry season;" it may not be unreasonable, therefore, to question whether a sufficient supply of water could be maintained upon high levels to sustain the enormous and constant drain incidental to a ship canal from loss by lockage and from evaporation. We rode from Gorgona to Panamá and thence to Cruces in February and March, 1845 (the "dry season"), crossing several streams which would probably be used to feed a ship canal (if it were resolved to open one) in that neighbourhood. When we forded them they were mere rivulets, the water in the deepest not reaching our mules' saddle girths, although in the "wet season" they become swollen torrents.

The impracticability of the bar and port of Chagres once admitted, Limon Bay must be looked to, if it be decided to cut a ship canal across this Isthmus; a breakwater, however, would be indispensable, and such a work thrown up in Limon Bay must be quite as expensive as the Plymouth breakwater, which we are informed cost more than two millions sterling!

Every circumstance considered, we may conclude that a canal, similar to that we have described, could not be completed for less than from six millions to seven millions sterling, nor (depending upon the labour of the country alone) in a shorter period than 18 years, during which *no return would accrue from the capital invested.*

Much has been said about the difference of level between the Atlantic and Pacific Oceans; the fact we believe to be simply this:—In the bay of Panamá the tide rises and falls

from 18 feet to 24 feet, as the ordinary or the equinoctial tides prevail ; at Chagres the rise and fall does not exceed the same number of inches ; thus it happens, that at one time of tide the waters of the Atlantic are higher than those of the Pacific, at another moment they are upon the same level, and at a third period the Pacific is above the low water line of the Atlantic Ocean.

CHAPTER VII.

FROM all we have heard, (although the information seems to rest very much upon conjecture,) the line of country best suited for a ship canal in this part of the world might be traced from the River Mandinga, in the Gulf of San Blas, to the River Chepo, which empties itself into the Pacific about 30 miles to the eastward of Panamá; the distance between the two oceans is said (and certainly seems) to be shortest thereabouts; the Indians, moreover, who inhabit that wild region, declare that in the rainy season (when the rivers are swollen) they sometimes drag their canoes from the Mandinga across the intervening country, and launching them upon the Chepo, follow the course of that stream into the Pacific Ocean.

We saw several San Blas Indians at Panamá, where they resort to find a market for the products of the fertile country they inhabit, and to a trifling extent cultivate. Short in stature, these Indians are deep-chested and robust, but by no means remarkable in other respects for the symmetry of their persons, although, in spite of a listless, stolid expression of countenance, they are not without intelligence, and are accounted a jealous and warlike race. They evince no reluctance to trade with Europeans or others who visit their coast, but they will not allow them to penetrate into the interior of the country, being apprehensive that if they did, their own tenure would not be strengthened thereby.

Mr. Perry, Her Britannic Majesty's Consul at Panamá, took a young chief of the San Blas tribe of Indians to reside in his house for some time, and when he thought his kind treatment had won upon the man, he addressed him to this effect:

"If I attempted to pass through your country to reach one great ocean from the other, would you oppose me?" "I would," (replied the savage,) "and be the first to drive a poisoned arrow into you." From this and other anecdotes of the determination with which these people exclude strangers from their territory, it is probable that the only methods of exploring it would be to take military possession of it, or await patiently the results attendant upon the slower but more congenial influence of civilization.

To achieve the first condition, a war of extermination must be waged against the aborigines, which justice and humanity alike forbid; the latter, time, good roads, increased facilities of communication, and (through them) an improvement in the social system of the Republic of New Granada, are calculated to develop, for the province of Darien being subject (albeit but in name at present) to the Government of New Granada, and adjoining the districts of Portobélo and Panamá, the "red man" of Darien must eventually mix with his "pale-faced" neighbours, and adopt their customs, or retreat before the march of civilization, and diving deeper into the interior, seek other wilds in which to hide himself. In either case his country would be no longer closed to those who might desire to explore it, and such examinations would then be practicable as should set at rest the question of its capability to afford facilities for the formation of a ship canal between the Atlantic and Pacific Oceans, the want of which, added to other considerations herein treated of, must necessarily defer the completion of that important work for years to come.

Whatever advantages or disadvantages the Isthmus of Panamá possesses for the establishment of a transit, earthquakes (say its inhabitants) do not disturb the surface of the soil;* its central situation, moreover, stamps it as the future

* M. de Humboldt is of opinion that the whole extent of territory from Venezuela to Mexico, both inclusive (and even farther), is volcanic, and subject,

high road of trade with the Pacific, and the time may not be distant when the commerce of China, Australia, New Zealand, and of the South Sea Polynesia,* will pour through that strip of territory, and by the same channel be returned to them those articles of manufacture and of trade for which enterprise and capital are ever demanding markets.

We must remark before we conclude our imperfect observations upon a subject worthy of the efforts of an abler pen, that it has never been our purpose to maintain, that a carriage-road, a tramroad, or even a railroad, would afford a means of transit preferable to or more convenient than a ship canal; we have simply contended that one or another of those methods of communication is at present the utmost that can be realized, they being *all that for half a century will pay*.

We have ventured our opinions freely (we hope not offensively) from a desire to aid the progress of a measure which commands our sympathies, and merits universal encouragement and support; if the attempt succeed, it will be cheering to know that our humble efforts have not been in vain.

more or less, to earthquakes. Remarking upon the effects of the great earthquake of the 26th March, 1812, which destroyed Caracas, and fearfully convulsed other portions of Costa Firme, he thus expresses himself: "At Vallecillo, a few leagues from Valencia, the earth opening threw out such an immense quantity of water that it formed a new torrent. On the other hand, the Lake of Maracaybo diminished sensibly." Reasoning upon the cause why certain intermediate points at the surface of the earth and in the direction traversed by earthquakes are unaffected by their influence, M. de Humboldt (as if to bear out the assertion of the Panamánians, that their province is not troubled by them, observes: "This phenomenon is frequently remarked at Peru and Mexico, in earthquakes which have followed during ages a determinate direction. The inhabitants of the Andes say with simplicity, speaking of an intermediary ground which is not affected by the general motion, that it forms a bridge (*que hace puente*); as if they meant to indicate by this expression that the undulations are propagated at an immense depth, under an inert rock."

* Had we been gifted with prescience, we might have included California in this category.

APPENDIX.

Panamá, 15th February, 1845.

SIR,—I beg to hand you the following observations made by me upon the proposed communication across the Isthmus of Panamá;* trusting they may be useful to you,

I am, Sir,

Your most obedient servant,

(signed) L. LEWIS, Jun.

Captain Liot, General Colonial Superintendent,
Royal Mail Steam Packet Company.

After 10 years of fruitless expectation, the government of New Granada (absolved from all past grants of “ Exclusive Road Privileges,” on the Isthmus of Panamá) is once more in a position to treat with parties who may desire to undertake (under the necessary guarantee) the formation of an efficient line of communication between the Atlantic and Pacific Oceans.

To lend an impulse to such a measure, I shall state what I consider are the probable sources from which a transit company would derive their revenue, and I shall venture an opinion of the amount such revenue might be expected to realize.

It is, I believe, admitted to be a truly commercial axiom, “ that the cheapest and nearest market is the best.” If that be correct, and if it can be shewn that by means of a good carriage road across the Isthmus, merchandize can be placed at Panamá as cheaply as it could be landed, by way of Cape Horn, at Valparaiso or Callao, the case lies in a nut shell ; and if Mazatlan, Acapulco, San Blas, San Salvador, Realejo, Punta Arenas, Choco, Guayaquil, Paita, &c., &c., are nearer to Panamá, and can obtain merchandize there as cheap or cheaper than at Lima or Valparaiso, Panamá must become their depôt, and the route by Cape Horn be ultimately abandoned.

* When the above was written the establishment by British enterprise of a convenient mode of transit across the Isthmus of Panamá was seriously contemplated. (See Preface.)

ESTIMATE OF COMMERCE IN THE REPUBLICS OF NEW GRANADA, ECUADOR, AND PERU.

NEW GRANADA.

REMARKS BY THE AUTHOR OF THE
PRECEDING PAGES.

MR. LEWIS'S STATEMENT.

The population of the Isthmus of Darien (an integral portion of the republic of New Granada) amounts to 119,102 souls. The other provinces of the Republic that would use a carriage road across the Isthmus are Pasto, Buenaventura, Choco, Cauca, and Popayan.

Under the oppressive fiscal regulations which exist, a great part of the consumption of those provinces is met by imports from Jamaica and a few direct from Europe.

According to the census of 1843, the population of the provinces named was as follows,—

	SOULS.
The province of Darien	119,102
„ Pasto	76,151
„ Buenaventura	37,104
„ Choco	27,360
„ Popayan	67,132
„ Cauca	60,860
Total Number of Inhabitants	387,709

To simplify my calculation I shall take the population referred to at 400,000, exclusive of Indians,* and the omissions in a census in this country fully equal the difference.

In this calculation Mr. Lewis has taken an average of the value of high and low priced merchan-

I shall next assume that to supply 400,000 people, imports would be required to the amount of

* The Indians are allowed to form a tenth part of the population.

dize; for instance, while a ton weight of calico might be worth £80 or more, the value of the same weight of linen, silks, &c., would be much greater, and that of many other articles perhaps considerably less.

The present cost of conveying a ton of merchandize from Chagres to Panamá is about \$80: if it were reduced to \$15 instead of \$12½ per ton, a Road Company would receive \$7,500 per annum more upon this item than Mr. Lewis calculates; goods in transitu, moreover, would be sent across the Isthmus in a day, and less exposed to damage than they are at present, 15 days being the average time now requisite to convey them from ocean to ocean, unless they are made up into small parcels, and are of the lightest description.

\$1,200,000 annually, or at the rate of \$3 worth for each individual; supposing a ton of goods then to cost \$400, there would be a demand for 3,000 tons, which, at a transit-rate of \$12½ per ton, should yield a revenue of \$37,500, and in time that amount would be augmented, as, with peace and order throughout the country, population must increase, and with facilities of transit, new markets would be opened and fresh wants created.

At this moment (owing to the dreadful state of the roads in the Republic) New Granada can hardly be said to have any exports; its returns, therefore, are chiefly made in gold and silver, and we might safely allow (in addition to any small exports of produce) that \$1,000,000 in specie and bullion annually cross the Isthmus,* from which a per centage might be derived, the rate and extent of which will be considered hereafter.

ECUADOR and NORTH PERU.

The population of Ecuador is estimated at 800,000; but, as the products of that country (the principal of which is cocoa) are such as to require for their export a considerable amount of shipping, I shall wave all considerations of difference in the length of voyage, in the interest upon capital and in

* When the above was written the Royal Mail Steam Packet Company had not made arrangements for the conveyance of treasure from Panamá to Chagres.

freight and insurance, and take it for granted that five-eighths of the exports would pass round Cape Horn, and three-eighths by the Isthmus of Panamá.*

Upon this assumption there would be 300,000 individuals to supply annually with imports (supposing the imports to pass by the same routes and in the like proportion as the exports) in the Republic of Ecuador.

The Provinces of Paita and Lambayeque (in North Peru) contain about 200,000 inhabitants, whose natural market (from its proximity) would be Panamá.

We might expect then to supply those countries with manufactures, &c., to the amount of \$1,500,000 annually, or at the rate of \$3 for each of their 500,000 inhabitants; at my previous calculation, therefore, of \$400 as the value of each ton of goods transmitted, we should convey annually (in this respect) 3,750 tons of merchandise, which at \$12½ per ton, would give \$46,875.

At \$15 per ton, this amount would be increased \$9,375.

The exports of Ecuador are timber, to Peru and Chili; cocoa to a considerable amount to Spain, Cuba, and other of the Antilles, Mexico (the North, West, and East coast,) Peru, Chili, and central America; and the much-prized Guayaquil hats, (commonly known as Panamá hats,) the value of the

We were told by General Flores that the export of Guayaquil hats

* We cannot see why the *whole* of the exports and imports from and to Ecuador should not pass across the Isthmus of Panamá if a good road were made.

from Ecuador amounts annually in value to \$1,000,000.

latter being at least half a million of dollars annually: at present a large portion of these hats reach the United States and Brazil by way of Cape Horn.

Guayaquil produces good tobacco, which at crop time can be bought as low as \$8 the quintal.

The cocoa exported from Guayaquil to Havana, the West Indies generally, and Mexico, passes at present round Cape Horn, but it would probably go by the Isthmus of Panamá, if a good road were opened there, and to the extent of 25,000 quintals, or 1,116 British tons, annually, which at \$12½ per ton would increase the transit-revenue \$13,950.

At \$15 dollars per ton the increase upon this item would be \$2,790.

It must be borne in mind that a considerable portion of the cocoa used in the interior and even in the city of Mexico, is conveyed there overland from San Blas and Acapulco, on the north-west coast of America.

The return from Havana and other parts of Cuba, would be white wax and tobacco; even now a considerable quantity of the first passes across the Isthmus, and the merchants have long wished to send tobacco to the west coast of South America by that route, but are prevented by the expense of transmission.

Besides the articles mentioned, North Peru exports cotton, bark, hats, &c., &c., most of which would probably find their way across the Isthmus, if a proper road were constructed.

TRADE WITH THE NORTH-WESTERN COAST OF AMERICA.

The trade of the north-west coast of America is either with Europe and the United States direct, or with the *entrepôts* at Lima and Valparaiso.

The countries bordering on that coast embrace an immense extent of territory, and contain a population of at least two millions and a half of souls.

Whether then, would their trade continue by the present route, or (if a good carriage road were made) find its way across the Isthmus of Panamá? As this is to a certain extent a question of figures, in attempting to solve it, I shall point out the advantages of the proposed route over that now used, and (to aid my endeavour) I again base my calculation upon the assumption that each inhabitant consumes at least £3 worth of foreign manufactured goods annually, which will make the gross consumption £7,500,000. It next becomes necessary to establish the gross weight of the merchandize, of which the value only has been stated, and to do so we must determine the cost of an assorted cargo from Europe or the United States, deliverable at a port on the north - west coast of America.

I believe I am moderate in stating that vessels (say) of 200 tons burthen, bring out cargoes

worth (on an average) £16,000 or \$80,000 each; resolving from this point, the value of each ton of merchandize would be \$400 or £80 sterling, and that of a cwt. of manufactured goods \$20 or £4 sterling.

I must now institute a comparison between the expense of conveying such a cargo to its destination, *viâ* Cape Horn or across the Isthmus of Panamá.

Most vessels from Europe, bound on trading voyages to the Pacific Ocean, touch at several intermediate ports on the west coast of America, before they arrive at their ultimate destination, their passages therefore are much prolonged.

The average passage of merchant vessels from London or Liverpool to Punta Arenas, Realejo, San Salvador, San Blas, Acapulco, Guaymas, Mazatlan, &c., is 150 days; although the time actually occupied will sometimes be from 180 to 200 days; however I take 150 days only as the mean.

The average passage from Liverpool or London to Portobélo is about six weeks or.....	} 42 days
The time expended in disembarkation, in the passage across the Isthmus, and in re-embarkation	} 3 "
The passage from Panamá to a port in central America....	} 15 "
The passage from Panamá to a port in Mexico being about 30 days, I add to the foregoing	} 15 "
	75 days

According to this computation 75 days* would suffice for the conveyance of a cargo of merchandize from England (and across the Isthmus of Panamá) to a port in central America or Mexico, a reduc-

* By sailing vessel; if steam power were used the time would be greatly reduced.

tion therefore in time of 75 days or two months and a half would be effected upon the length of passage as it is at present. The interest upon \$80,000 for 75 days at 5 per cent. per annum only is \$833:33.

The next point to settle is the difference of outlay for insurance. The present rate from England to Lima, Valparaiso, &c., by Cape Horn, is $2\frac{1}{2}$ to 3 per cent; to central America or Mexico, therefore, it ought to be higher; I shall take it, however, at 3 per cent. or \$15 per £100 sterling. Insurance is usually effected from England to Jamaica at $1\frac{1}{4}$ per cent., and Portobélo being only a short distance farther, a much better port and easier of access than almost any port in Jamaica, the rate of premium to both places would probably be the same—say $1\frac{1}{4}$ per cent. or \$6 : 25 to each.. \$6 25

Upon every £100 sterling, the transit across the isthmus in covered waggons might be assured at $\frac{1}{4}$ per cent.	}	1 25
Insurance from Panamá to central America, or Mexico (a very trifling risk, say $\frac{1}{4}$ per cent.	}	2 50
		\$10 0

Thus the saving upon the insurance being £1 or \$5 on every £100 sterling, upon \$80,000 it would amount to \$800.

The last thing to consider is the rate of freight. A fair average from London or Liverpool to cen-

We believe £5 per ton would be nearer the truth.

If we may judge by the coal freights of the Royal Mail Steam Packet Company this rate has been fixed at double the amount it should have been.

This rate is fixed too high.

tral America or the North West coast of Mexico (*via* Cape Horn) might be taken at £6 or \$30 per ton.

There is little doubt that the same vessel would convey a similar freight from either of the two first mentioned ports to Portobélo for £2 per ton.

The rate of freight from Valparaiso or Lima to central America or Mexico cannot exceed \$10 per ton, and as the voyage from Panamá to the latter countries is much shorter, the charge for freight should be less ; supposing it, however, to be equal, the saving of freight upon the before-mentioned cargo of 200 tons would be £2 (\$10) per ton, or \$2000 upon the whole amount of tonnage ; moreover, a saving *pro ratâ* must almost always accrue, for be the shipping interest in whatever state it may, a difference in the time consumed on the voyage must of necessity influence the rate at which shipowners can afford to charter their vessels.

This comparative calculation shews a reduction in favour of the transit by Panamá over the passage round Cape Horn, as follows,

Interest on Capital taking a cargo of 200 tons to be worth about £16,000 or \$80,000	}	\$833 33
On Insurance		
„ Freights		
		\$3,633 33

From this amount must be de-

We assume the transit charge to be \$15 per ton: the over-statements, however, on both sides, in this part of Mr. Lewis's estimates will be found very nearly to balance.

Portobélo and Panamá, (the termini of the proposed line,) would be made Free Ports by the New Granada Government.

ducted the cost of transporting the cargo of 200 tons by the road, which should not exceed £2 : 10 or \$12½ per ton,—every expense of wharfage, carriage, &c., included. The transit charge, then, upon the whole cargo would amount to \$2,500, and the absolute saving of expense alone (to say nothing of the advantage of rapid communication) would be \$1,133 : 33 if it were conveyed across the Isthmus of Panamá instead of by Cape Horn.

There are other items of reduction upon the charges on merchandize, which might be diverted from the *entrepôts* of Valparaiso and Lima to Panamá, such as port-charges, agencies, fiscal regulations, &c., and which may be more particularly dwelt upon hereafter, that is, when the road is formed and the transit rendered free of duties (as it will be) by the Government of New Granada.

Agency commissions and commissions on sales would not be greater at Panamá than at Callao or Valparaiso, and as regards the Mexican trade, it is chiefly supplied from the South-West coast; few direct importations are made.*

Having thus shewn that a saving of time and of expense is attainable by the adoption of the Isthmus of Panamá as a high road for merchandize to the Pacific, it remains to point out what advantage a

* This practice has altered of late.

transit company would be likely to derive from it.

I have already estimated the cost of the merchandize supposed to be annually required for the markets treated of, at \$7,500,000, and an assorted cargo of 200 tons as worth \$80,000 or at the rate of \$400 per ton, hence a result to the road is obtained of \$234,375 for conveying 18,750 tons of merchandize across it at a rate of \$12½ per ton, and although this estimate is assuredly understated, I consent to halve its amount and take \$117,187½ only, as the income derivable from such source.

In return for their imports, central America and Mexico export largely of indigo, cochineal, coffee, Nicaragua wood, mahogany, &c., &c. I am unable to say to what extent, but the three first articles, with the specie and bullion from those countries, must form a considerable item in the traffic of the road; at the present moment those costly articles known as 'treasure' take the circuitous route by Cape Horn, and the inconvenience and loss attending it may well be imagined.

Intelligent commercial gentlemen from Lima, who have read Mr. Lewis's report, think his calculations are much too low; if such be the case, why should his estimate of road revenue be reduced one half?

Taking the whole amount of tonnage at \$15 per ton, we must add to the reduced estimate of Mr. Lewis the sum of \$164,062½.

BULLION and SPECIE.

Mr. Macqueen calculates the amount of specie shipped yearly from the western coast of America to Great Britain at \$10,000,000, and to the United States at \$5,000,000. Shipments of specie are also made

The amounts of bullion and specie said to be exported annually from the west and north-west coasts of America are various, some estimate them at 20 millions of dollars: the following statement,

from the Pacific to France, Germany &c.

From an excess of apprehension lest his estimates should be thought too favourable to his own views, Mr. Lewis runs into the opposite extreme.

A commercial gentleman of Lima, conversant with this subject, observes, "In the statement made by Mr. Lewis, I notice that he has considerably underrated the exports of bullion from the Pacific; I am persuaded that had he estimated the amount annually exported at 20 millions he would still have been within bounds: my calculation is thus,"—

Peru	\$4,500,000
Chili	5,500,000
Ecuador & New Granada..	2,000,000
Mexico & Central America	8,000,000
	\$20,000,000

however, may be nearer the truth, viz.,

Chili	\$2,000,000
Peru and Bolivia	3,000,000
Ecuador & New Granada..	1,000,000
Central America	1,000,000
Mexico	3,000,000

Total exported \$10,000,000

At present, nine tenths of this amount reach Europe and the United States *viâ* Cape Horn: whether their course can be changed to the Isthmus of Panamá is a result the likelihood of which is worthy of investigation, and to arrive at a safe conclusion, it will be requisite to determine the cost of conveying \$100 to the Bank of England *viâ* Cape Horn, and add to that a sum for interest during the time of the passage home; we must then consider the expense of placing the amount specified in the Bank of England, by way of Panamá.

The export duties upon specie, &c., shipped for ports in the Pacific, says Mr. Wheelwright,* are $3\frac{1}{4}$ per cent. if the shipments be made in steam vessels, and 5 per cent. if they take place in ships of war or merchant sailing vessels, thus shewing an advantage of $1\frac{1}{4}$ per cent. in favour of steam. This (*primâ facie*) may be correct; but as the privilege under which the low scale of export duty prevails is temporary, and was con-

* See a Pamphlet published by him in 1843.

ceded by certain of the South American Republics expressly to encourage steam navigation on their own coast, its continuance necessarily depends (after the expiration of the limited charters held by the Pacific Steam Navigation Company) upon the will of the Republics to which we have referred.

Again,—the passage from Lima to Europe, *viâ* Panamá, is stated by Mr. Wheelwright at 38 days, although it might be safer to compute it thus,—

From Lima to Panamá, touching at the intermediate ports, ...	} 10 days
From Panamá to Chagres	2 „
„ Chagres to England....	34 „

Making the total length of Passage 46 days

On the other hand, the time allowed from Lima to England, *viâ* Cape Horn, is too short; but suppose a merchant vessel (not being detained after her specie shipment was received) made the passage to England (once in a way) within the time (110 days) taken by Mr. Wheelwright as the average, how often, I ask, would that occur, or how many vessels of war from the Pacific would there be whose freights reached England within that time.

Remittances from the north-west coast of Mexico, are exposed to immense delays, and have not unfrequently been detained on board vessels of war for six, eight, and even twelve months.

I calculate the cost then of shipping specie, &c., by merchant vessels, from Lima to England, *vid* Cape Horn, thus—

	Per Cent.
Insurance from Valparaiso or Lima } to England on \$100	1½
Freight.....	1½
Interest for 64 days on \$100 at 5 } per cent per annum.....	7
Cost by Cape Horn in merchant } vessels	3½

BY VESSELS OF WAR.

	Per Cent.
Freight	2
Insurance	1
The difference of time in the delivery of specie, &c., (Mexican remittances included) at the Bank of England cannot be less than four months on an average, the in- terest upon which will be	1½
Cost by Cape Horn in men of war..	4½

I shall next consider at what cost a similar remittance could be made by way of Panamá, if an efficient transit were established there.

	Per Cent.
Freight from Lima or Valparaiso } to Panamá	¾
Freight across the Isthmus, includ- ing agencies and expenses of all kinds (except Insurance).....	½
Insurance from Lima or Valparaiso } to Europe, <i>vid</i> Panamá	1½
Freight from Portobélo to Europe..	1½
Rate of expense of conveyance from } Lima or Valparaiso to Europe, <i>vid</i> Panamá*	3½

* Experience has proved the rate of expense actually incurred (as matters at present stand) to be as follows:—

	Per Cent.
Rate of Freight charged by the Pacific Steam Navigation Company upon } Treasure conveyed by them from ports on the south-west coast of Ame- rica to Panamá	7
Rate charged by the Royal Mail Steam Packet Company from Panamá to the } Bank of England, including Transit charges, Agencies, &c.	1½
Insurance	1½
Actual rate per cent. of expense upon the transmission of Treasure from } ports on the south-west coast of America to the Bank of England..	3½

These calculations shew a pecuniary advantage to the shipper by merchant vessels round Cape Horn of $\frac{1}{4}$ per cent.,* although it is worthy of consideration whether shippers might not think such difference more than met by the benefit of being able to calculate (almost with certainty) upon the time of arrival of their remittances at the Bank of England.

If the amount of Specie passed across the Isthmus of Panamá annually by a transit company were to be £20,000,000, at a charge for conveyance of $\frac{1}{4}$ per cent.,† it would yield £100,000; we are of opinion, however, that $\frac{1}{4}$ per cent. would (with a railroad) be an ample transit charge upon treasure, and all in fact it could afford to pay.

If the Governments of Chili and Peru continue the privilege they have conceded to the Pacific Steam Navigation Company, the issue of this question cannot be doubted, and as regards specie shipments by vessels of war, we have only to place in juxtaposition the figures ' $3\frac{1}{8}$ ' and ' $4\frac{1}{8}$ ' to shew (as respects this branch of traffic) the advantage of a transit by Panamá in the strongest possible light.

On the whole, then, I am of opinion that, under a proper state of things, the Income from Treasure would annually amount to £50,000 at least, or $\frac{1}{4}$ per cent. (including all expenses), upon the £10,000,000, estimated as likely to be transported yearly from sea to sea.

The WHALE FISHERY in the PACIFIC.

The benefit which this important branch of commerce would derive

* The practice elicited by the present transit arrangements of the Royal Mail Steam Packet Company shews an advantage of $\frac{1}{4}$ per cent. to the shipper of treasure by way of Panamá.

† Experience has taught us that the actual charges (exclusive of agency commission) for conveying treasure from Panamá to Chagres (even with the present expensive and inefficient means) are under $\frac{1}{4}$ per cent.

from an extensive means of transit across the Isthmus of Panamá, is too great to be passed over without remark.

The whale Fishery in the Pacific is chiefly in the hands of the British and the Americans, although it finds employment for some French and a few German vessels.

"In the year 1832," says M'Culloch, "the American whale fishery yielded 67,166 barrels of oil, of 30 gallons each; that quantity at an average price of 75 cents per gallon would realize \$1,511,235. American vessels employed in this fishery are fitted out in the United States for a three-years' cruise, and unless they "fill up" within that period, they do not return home at its expiration, but remain out perhaps for four years.

It sometimes happens, however, that being fortunate during the first twelve months of their cruise they fill 1,000 or 1,500 barrels (in that time) with oil, the loss of interest upon the value of which, and the leakage must be considerable; for if a thousand (30-gallon) barrels of oil be kept on board from the period of the first twelve months until the end of the cruise, the sum they would realize (\$22,500) must remain two years without bearing interest, which, at 6 per cent. per annum, (the legal rate of interest in the United States,) would amount to \$2700.

That sum then under some circumstances may be said to be an-

nually lost to a whaling vessel independent of *leakage*, whereas if the oil were conveyed across the Isthmus of Panamá to the United States, at a charge sufficiently moderate, there can be little doubt of its being so forwarded, or of its yielding a return remunerative to a transit company.

For instance, if 10 barrels of oil (of 30 gallons each) weigh a ton, 1,000 similar barrels would weigh 100 tons, the

At \$15 per ton this item would be increased \$250, and the saving to "whalers" reduced to \$200, exclusive of leakage.

Carriage upon which at \$12½	}	\$1250
per ton would be		
A merchant vessel could convey these thousand barrels from Portobélo to New York in	}	1,000
from 17 to 20 days for		

Total expense of transport \$2,500

A saving would thus arise of \$450 or 2 per cent. upon the gross value of the shipments exclusive of leakage.*

Although I have touched upon the subject of the whale fishery, because that branch of trade seems a probable source of revenue to a transit company, I have not swelled my estimate by any large amount as likely to be derived from it, although in a few years it might be productive.

THE HUDSON'S BAY COMPANY.

With the nature of this Company's business I am not conversant; I think, however, that if a

* The loss by leakage on board whaling vessels is *considerable*.

transit communication were opened across the Isthmus of Panamá, the greater part of their valuable skins and furs, as well as most of their supplies, would pass that way.

TRADE from the ISLAND of CUBA.

The trade from Cuba to the west coast of South America is chiefly in tallow and wax, but it is not extensive, because large shipments lower the prices. If a transit were established however, the articles mentioned would pass to the Pacific, by way of Panamá, and (judging from existing data) there should not be less (annually) than 200 tons of tobacco and 50 tons of wax, or 250 tons in all, which at $\$12\frac{1}{2}$ per ton would yield a revenue of $\$3,125$.

At \$15 per ton, \$750 must be added to this item.

ESTIMATE of the NUMBER of PASSENGERS who would probably travel by this route.

The number of passengers that have crossed the Isthmus of Panamá annually, under existing difficulties, drawbacks, &c., has been about 200, but it is fast increasing, and with proper land conveyance, and steamers on both seas, must augment both rapidly and largely; as I desire, however, to keep this estimate strictly within bounds, I shall assume the annual number at pre-

Here again the fear of overstating his case has led Mr. Lewis into error! we are of opinion he might fearlessly have increased his estimate of passenger traffic ten-fold. If a proper system of transit were established across the Isthmus of Panamá, nearly every passenger from Europe and North America for the West and North-West shores of the Pacific, for the islands in that ocean, for New Zealand, for Van Dieman's Land, for the eastern parts of Australasia, for the Islands in the Indian Ocean, and many likewise for China would go and return that way.*

The value of time is too keenly appreciated in the present day for individuals to volunteer upon a long and stormy passage, if they can arrive at their destination in a much shorter period, and by a more agreeable route.

A long sea passage has been considered disadvantageous to emigrants; if this be true, those who may be bound to the countries we have enumerated, are more likely to cross the Panamá high road than undertake the stormy voyage by the Cape of Good Hope or by Cape Horn, that is, if the charge for passage were not much higher in one case than in the other.

sent to be 500, a fair charge for conveying which, from sea to sea, might be \$6 each; \$3,000 therefore would be yielded annually by this branch of revenue, to which might be added the freight on baggage (say 100 tons at \$12½ each) or \$1,250; this charge is very low and might very fairly be doubled.

As traffic increased, the number of passengers would also increase, and a desire to travel be engendered by the facility with which it might be gratified.

I will pursue my calculation by supposing the road to be made, the transit in full operation, and that four passengers cross daily or 1,460 annually, at \$6 per head, this number would give an income of \$8760, independent of the sum received for conveying their luggage. In a few years that amount would be vastly increased, as I have abstained from noticing in my calculation the passengers that might cross the Isthmus to and from Australia.

TOLLS on the ROAD and WHARFAGE.

It is difficult to deal with this subject in anticipation, but as the

* Late events in California have thrown the above calculation into the shade.

The allowance for tolls and wharfage is obviously insufficient, —only £1000 per annum !

road formed and paid for by a company must be for its exclusive advantage, those who travel upon it, whether in carriages, on horse-back, or on foot, should pay toll ; wharfage too should be charged on goods left in the Company's warehouses beyond a certain fixed time ; as any estimates of receipts from tolls and wharfage, however, must be necessarily vague, I shall put down the very small sum of £5000 per annum as applicable thereto, although, in a few years, this item of revenue might be considerable.

EXPORTS from CENTRAL AMERICA.

The population of this country in 1839 amounted to 200,000, and its exports were
5000 serons of Cochineal, each of
150 lbs.

7000 serons of Indigo, each of
150 lbs.

40,000 lbs of Balsam Peru,

20,000 Hides,

25,000 quintals of Coffee.

Besides Nicaragua or Brazil wood, mahogany, cedar, sarsaparilla, tortoise-shell, and common dark sugars.

All the cochineal and indigo, most of the coffee, balsam of Peru, tortoise-shell, and hides, (if not of the sarsaparilla), would be sent across the isthmus. Since 1839 the exports of central America have greatly increased, nevertheless, I shall base my calculation upon the return of that year.

If the transit charge be \$15 per ton, the amount stated in the context should be increased by \$5425.

12,000 serons of Cochineal & Indigo of 150 lbs each or 900 tons at \$12½	\$11,250
(Mc Culloch says that the exports of Indigo from Guatemala in 1845 amounted to 1,800,000 lbs. or 900 tons.)	
40,000 lbs. of Balsam of Peru } or 20 tons at \$12½	250
25,000 quintals Coffee or 1250 tons at \$12½	15,625
Total value of revenue upon exports.....	\$27,125

Hides, tortoiseshell, &c., are not included in the foregoing calculations, and cochineal and indigo (being costly articles requiring greater care in their conveyance) should command a higher rate of freight.

EXPORTS of the ISTHMUS OF PANAMA.

By promoting a judicious system of immigration the tract of land which a Transit Company would be permitted to purchase on the Isthmus at small cost, might be made to return a large income.

The cocoa grown in the neighbourhood of Portobélo ranks among the finest in the world,

The exports from the Isthmus of Panamá are inconsiderable and principally consist of gold dust, pearls, hides, sarsaparilla, and mother of pearl shells, amounting in all to \$150,000 or \$200,000 per annum; with a commodious line of transit, however, the aspect of affairs would change, and by the aid of foreign industry and enterprise, with even a limited amount of capital, much might be accomplished in a country of which the soil cannot be exceeded in fertility and is capable of yielding abundantly all kinds of tropical productions, such as coffee, cocoa, indigo, sugar, and tobacco; its mines of gold, copper, and iron too (if worked) are calculated to

and has always commanded the highest prices.

yield some amount of revenue to a Transit Company from the traffic they would induce.

SUMMARY of the FOREGOING CALCULATIONS.

We have said we consider that Mr. Lewis's estimates are too low, and that \$15 instead of \$12½ should be charged upon every ton of merchandize transported across the Isthmus of Panamá; the following sums, therefore, should be added to the gross estimates of revenue shewn in the context, viz.,

\$7,500	(vide page 43)
9,375	" 44
2,790	" 45
164,062½	" 51
250	" 57
750	" 58
5,425	" 61

190,152½ Total of sums to be added to

323,772½ { the supposed amount of road revenue estimated by Mr. Lewis.

————— { Probable total amount of Revenue which, at 4s. 2d. per dollar, would give
\$513,924½ { £107,067 : 13 : 3 sterling.

Trade of part of New Granada (Imports).	\$37,500
Trade of part of Ecuador & North Peru (Imports) }	46,875
Exports of Cocoa from Guayaquil to the West Indies, Havana & Mexico }	13,950
Trade with the north-west coast of America, central America & Mexico (Imports)	117,187½
Transit of Specie & Bullion..	50,000
Trade from Cuba.	3,125
Passengers	13,010
Tolls on the Road, & Wharfage	5,000
Exports from central America	27,125
Exports from the isthmus, central America, Ecuador, and Peru, in hides, pearls, tortoiseshell, sarsaparilla and other effects not enumerated	10,000

Supposed amount of road revenue. } \$323,772½

CONCLUSION.

After the road track has been selected and cleared, it should be used immediately for the conveyance of specie and light merchandize, on account of the revenue that would be obtained, and that no time might be lost in accusing the public to look upon the

I shall close these remarks by observing that the amount of revenue stated in the preceding calculation is not expected to be realized immediately the road is opened, but in four or five years after. The first year's revenue might be small, but as the advan-

Isthmus of Panamá as one of the great commercial thoroughfares of the world and make use of it accordingly.

tages of the new line became known, so would its traffic augment and its revenue increase. It requires no gift of prophecy, therefore, to foretell that in less than ten years of its completion Cape Horn would become, (as stage coaches are in England at the present time) a matter rather of history than of convenience to the public.

(signed) **LEWIS** LEWIS, jun.

Panamá, Feb., 1845.

